CHESUNOV, V.M.; SIDOROV, V.G.; KOSHMAN, G.K.

Continuous control of the moisture content of semifinished artificial latex leather. Kozh.-obuv.prom. 2 no.9:33-34 S '60. (MIRA 13:10)

(Leather, Artificial)

SIDOROV, V.G., inzhener.

Improving arc extinguisher chambers. Elek. i tepl. tiaga no.4:29 Ap '57. (MLRA 10:6)

(Electric railroads--Substations)

Report presented at the 3rd National Conference on Semiconductor Compounds, Kishinev, 16-21 Sept 1963

-2-

2. Electrical properties of highly degenerate crystals of n- and p-type gallium arsenide. O. V. Yemel'yanenko, F. P. Kesamanly, D. N. Nasledov, V. G. Sidorov, G. N. Talalakin.

Concerning the interaction of electrons with lattice vibrations in gallium arsenide. O. V. Yemel'yanenko, T. S. Lagunova, D. N. Nasledov, V. Ye. Shcherbatov.

Electrical properties of gallium arsenide with different impurities. D. N. Nasledov, G. N. Talalakin.

Investigation of the properties of impurity zones in crystals of p-type gallium arsenide. O. V. Yemel'yanenko, T. S. Lagunova, D. N. Nasledov, V. Ye. Shcherbatov.

Galvanomagnetic properties of indium arsenide in a wide temperature range. Yu. M. Burdukov, I. V. Zatova, T. S. Lagunova, D. N. Nasledov.

Nernst effect in n-type indium phosphide.
F. P. K , E. E. Klotin'.
(Pr Ben . V. Yemel'yanenko--25 minutes).

BURDUKOV, Yu.M.; YEMEL'YANENKO, O.V.; ZOTOVA, N.V.; KESAMANLY, F.P.; KLOTYN'SH, E.E.; LAGUNOVA, T.S.; NASLEDOV, D.N.; SIDOROV, V.G.; TALALAKIN, G.N.; SHCHERBATOV, V.Ye. [deceased]

Transfer effects in $A^{III}B^{V}$ type compounds. Izv. AN SSSR. Ser. fiz. 28 no.6:951-958 Je '64. (MIRA 17:7)

1. Fiziko-tekhnicheskiy institut imeni A.F. Ioffe AN SSSR.

L 20349-65 EWT(l)/EWG(k)/EWT(m)/T/EWP(t)/EWP(b)/EWA(h) Pa-6/Peb IJP(c)/SSD/
AFWL/ASD(a)-5/AS(mp)-2/AFETR/RAEM(a)/ESD(gs)/ESD(t) JD/AT
ACCESSION NR: AP4041353 S/0048/64/028/006/0951/0958

AUTHOR: Burdukov, Yu.M.; Yemel'yanenko, O.V.; Zotova, N.V.; Kesamanly, F.P.; Klotyn'sh, E.E.; Lagunova, T.S.; Sidorov, V.G.; Talalakin, G.N.; Scherbatov, V.Ye. (Deceased); Nasledov, D.N. (Doctor of physico-matematical sciences)

TITLE: Investigation of transfer effects in $A^{III}B^{V}$ type compounds (Report, Third All-Union Conference on Semiconductor Compounds held in Kishinev 16-21 Sep 1963)

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.6, 1964, 951-958

TOPIC TAGS: semiconductor, semiconductor research, semiconductor band structure, Hall effect, Nernst Ettinghausen effect, electric conductivity, gallium arsenide, indium arsenide, indium phosphide

ABSTRACT: The present paper is a review of the results of experimental studies of transfer effects in $A^{III}B^{V}$ type compounds, specifically, gallium arsenide, indium arsenide and indium phosphide, with emphasis on the first. The work of other authors, Soviet and non-Soviet, is referred to, but for the most part the data and discussion are based on investigations by the authors' group. The main purpose of these studies was to investigate the energy spectrum and characteristics of the impurity

Card 1/3

band (zone) and elucidate the mechanism of electron scattering in these semiconductor compounds. The assumed band structure of GaAs is described. Extensive measurements were made of the thermo-emf of the compounds in order to investigate the structure of the allowed bands. Data and curves are given for the dependence of the effective electron mass on the carrier concentration in the crystal, the temperature dependence of the Hall constant, the temperature dependence of the height of the Fermi level, the temperature dependence of the relative resistivity increment ($\Delta\rho/\rho$) in a magnetic field, the Nernst-Ettinghausen effect, all for n-type GaAs; the dependence of the hole mass on the hole concentration in p-type GaAs; the temperature dependence of kinetic effects in InP; the temperature dependences of the Hall constant and $\Delta\rho/\rho$ and the field dependence of $\Delta\rho/\rho$ for n-type InAs. The mechanism of interaction of electrons with lattice vibrations in gallium arsenide and indium arsenide is discussed. Impurity effects are considered and various models are evaluated from the standpoint of their agreement with experiment and practical utility. Orig.art.has: 5 formulas and 9 figures.

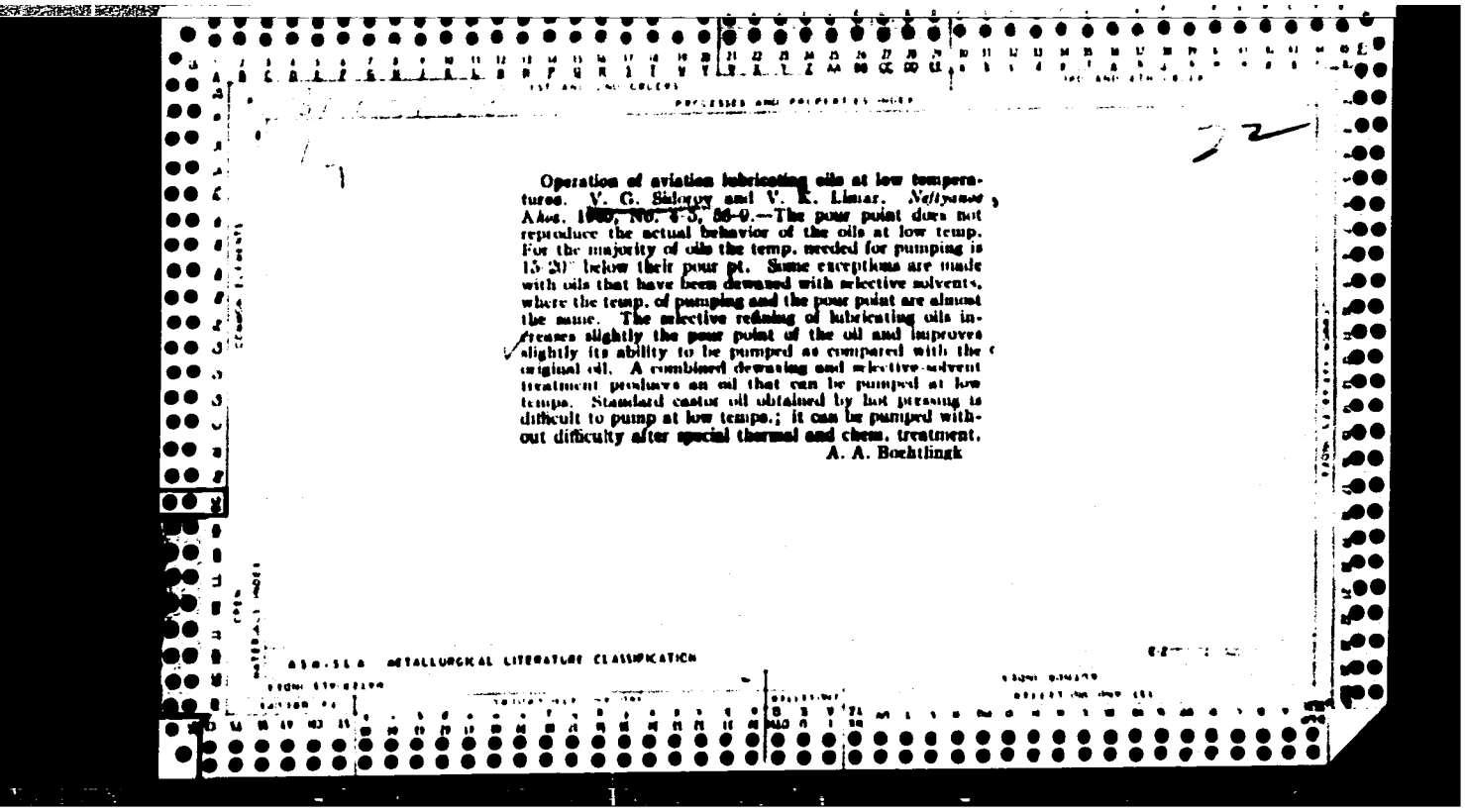
L 20349-65
ACCESSION NR: AP4041353

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences, SSSR)

SUBMITTED: 00 ENCL: 00

SUB CODE: SS, EM NO. REF SOV: 008 OTHER: 006

Card 3/3



Operation of aviation lubricating oils at low temperatures. V. G. Sidorov and V. K. Limar. *Neftyanoe Khoz.* 1950, No. 4-5, 88-9.—The pour point does not reproduce the actual behavior of the oils at low temp. For the majority of oils the temp. needed for pumping is 15-20° below their pour pt. Some exceptions are made with oils that have been dewaxed with selective solvents, where the temp. of pumping and the pour point are almost the same. The selective refining of lubricating oils increases slightly the pour point of the oil and improves slightly its ability to be pumped as compared with the original oil. A combined dewaxing and selective-solvent treatment produces an oil that can be pumped at low temps. Standard castor oil obtained by hot pressing is difficult to pump at low temps.; it can be pumped without difficulty after special thermal and chem. treatment.

A. A. Boehtlingk

PROCESSES AND PROPERTIES INDEX

CA

12

Stability of phlorizin under conditions of use in airplane motors. V. O. Shitsov. *Neftyanoe Prom.* 22, 107-9 (1941); *Chem. Zentr.* 1943, I, 472.—The stability of phlorizin in airplane motor lubricating oil was tested in 60-hour single-cylinder engine-tests using "SS" brand lubricating oil alone, castor oil and "SS" lubricating oil with 2% phlorizin. Lubricating oil alone gave the best results, the rings remained free, and soot deposition on the piston and valves was insignificant. Results were somewhat poorer with castor oil, one ring stuck and there was considerable soot formation. Much poorer results were found with lubricating oil plus 2% phlorizin, the rings stuck, soot formed and a whole series of deposits of coke and resins were found in the filter and oil reservoir.

R. W. Ryan

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

PROCESSES AND PROPERTIES INDEX

22

Viscosity and mobility of oils at low temperatures. V. K. Lamar and V. G. Sukorov. *Akad. Nauk S.S.S.R., Otdel. Tekh. Nauk, Inst. Mashinovedeniya, Soveshchanie po Vyazkosti Zhidkostei i Kolloid. Rastvorov (Conf. on Viscosity of Liquids and Colloidal Soln.)* 2, 145-54(1944). An app. was constructed in which the behavior of motor oil at low temp. is investigated under conditions closely approximating those of actual service. The oil is pumped from a brass tank of 7 l. capacity through a pipe and stop-cock and is collected and weighed. Measurements at 3 pressures of the reducing valve, 3.0, 6.0, and 9.0 kg./sq. cm., showed the rate of feeding to be linear. All subsequent measurements were made under 6.0 kg./sq. cm.; duration of each expt. 30-60 sec.; results are expressed in Q (g. of oil per revolution of the pump); the limiting temp. of mobility t' is the temp. at which Q becomes practically 0.0. For 2 specimens of petroleum oil (Dossor) of, resp., E_{50} = 2.71 and 2.30 and viscosity ν_{50} = resp., 17.40 and 14.08 centistokes, same freezing temp. -20°, t' was found, resp., approx. -19° and -11°. Consequently, t' does not depend on the freezing temp. but depends rather on the high-temp. viscosity. Two samples of deparaffined Surakhan petroleum oil, acid-treated (freezing at -16°, E_{50} = 3.27) and nitrobenzene-treated (freezing at -12°, E_{50} = 3.21), showed a very close Q over the whole temp. range and the same t' of -11°. An automobile lubricating oil (E_{50} = 1.72, freezing temp. -28°) had t' = -25°. Selectively purified automobile oil (E_{50} = 1.61, freezing -26°) showed t' = -29°. Two synthetic oils of E_{50} = 3.14 and 2.77, both freezing at -30° and less than -30°, had t' = -20° and -30°. Castor oil (E_{50} = 2.70, freezing temp. -16°) could be fed down to -10°; however, after 10 hrs.' holding at -30° to -11°, the oil hardened and could only be fed at temp. above 2°. This anomaly disappears with prepared castor oils of E_{50} = 3.00 or 2.35 (freezing temps., resp., -34° and -50°). Actual motor-starting tests in cold weather demonstrated that t' as measured in the app. described, is close to the lower limiting starting temp. of the motor. N. Thon

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

SIDOROV, V. G.

Topliva i masla dlia sovremennykh aviatsionnyk motorov. Moskva, 1947.
Title tr.: Fuels and lubricants for modern aircraft engines.

NCP

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress, 1955.

SIDOROV, V.G., inzhener; POTAPENKOV, V.M., inzhener.

Standardizing petroleum products and methods for testing them. Standartizatsiia no.2:77-78 Mr-Ap '56. (MLRA 9:5)
(Petroleum--By-products--Standards)

SIDOROV, V.G., aspirant; VASIL'YEV, S.S., doktor khimicheskikh nauk, prof.

Evaporation of liquid into a gas-filled space under extensive change of the conditions of gas flow over the surface of evaporation. Report No.3. Nauch. trudy MTILP no.30:207-213 '64. (MIRA 18:6)

1. Kafedra fiziki Moskovskogo tekhnologicheskogo instituta legkoy promyshlennosti.

L 21435-66 EWT(1)/EWT(m)/EWP(t) IJP(c) JD/JG/AT

ACC NR: AP6002048 SOURCE CODE: GE/0030/65/012/002/K093/K095

AUTHOR: Emelyanenko, O. V.; Nasledov, D. N.; Sidorov, V. G.; Skripkin, V. A.; Talalakin, G. N.

ORG: Physico-Technical Institute im. A. F. Ioffe, Academy of Sciences SSSR, Leningrad

TITLE: Effective mass of electrons in n-GaAs

SOURCE: Physica status solidi, v. 12, no. 2, 1965, K93-K95

TOPIC TAGS: effective mass, Hall coefficient, thermoelectric power, gallium arsenide, semiconductor

ABSTRACT: In order to determine directly the effective mass m^* of electron charge carriers, the authors made measurements of the Hall coefficient R_∞ and of the thermoelectric power L_∞ of semiconductors in strong magnetic fields $H \to \infty$ without quantization effect. In all four n-GaAs samples up to the fields 31 kg ($0 < \mu H/c < 3$) were measured. The Hall coefficient was found to be field-independent (± 2). The thermoelectric power L increased or decreased with H (the magnetic field strength). The calculation was made with the aid of the formula

$$L(H) - L(0) = L(H) = \frac{AH^2}{1 + BH^2}.$$

Card 1/2

L 21435-66
ACC NR: AP6002048

The effective mass of electrons is 0.072 m_0 at the bottom of the band (pure samples 1 and 2 at low temperatures). For a deviation from the band from the parabolic shape, the effective mass of samples 1 and 2 (at all temperatures) $m^* = (0.070 \pm 0.002)\ m_0$ at the bottom of the band, being equal to effective masses obtained by other methods (Palik, E. D., Stevenson, J. R., and Wallis, R. F., Phys. Rev. 124, 701, 1961). The slightly higher value of m^* in more impure samples 3 and 4 may be due to the effect of the impurity band. The author presents tabulated data on effective mass values attained at various temperatures. Orig. art. has: 1 figure, 1 formula, 1 table. [LD]

SUB CODE: 20/ SUBM DATE: 23Oct65/ ORIG REF: 003/ OTH REF: 001

Card 2/2 UDC

L 02382-67 EWP(t)/ETI IJP(c) JD

ACC NR: AP6012013 SOURCE CODE: GE/0030/66/014/002/K195/K199

AUTHOR: Filipchenko, A. S.; Molodian, I. P.; Nasledov, D. N.; Sidorov, V. G.; Emelyanenko, O. V.

ORG: Joffe Physico-Technical Institute, Academy of Sciences, SSSR, Leningrad

TITLE: On the second conduction band in indium antimonide

SOURCE: Physica status solidi, v. 14, no. 2, 1966, K195-K199

TOPIC TAGS: indium compound, antimonide, conduction band, Hall effect, Fermi level, electron transition

ABSTRACT: Data are presented to show the existence of a conduction band in InSb located about 0.5 ev above the bottom of the main conduction band (000). The rise in the Hall coefficient with temperature was measured in 14 indium antimonide samples doped with selenium or tellurium. The hypothesis that this rise is due to electron transitions to a second conduction was tested and the value of the gap determined. Orig. art. has: 1 table, 4 formulas.

SUB CODE: 20/ SUBM DATE: 09Mar66/ ORIG REF: 004/ OTH REF: 005

Card 1/1 vmb

ACC NR: AP7001973 SOURCE CODE: GE/0030/66/018/002/0677/0682

AUTHOR: Molodyan, I. P.; Nasledov, D. N.; Sidorov, V. G.; Radautsan, S. I.

ORG: [Nasledov; Sidorov] A. F. Ioffe Physicotechnical Institute, Academy of Sciences, USSR, Leningrad; [Molodyan] Institute of Applied Physics, Academy of Sciences of the Moldavian SSR, Kishinev; [Radautsan] Kishinev Polytechnical Institute

TITLE: The effective mass of electrons in $(InSb)_x \cdot (InTe)_{1-x}$ Crystals

SOURCE: Physica status solidi, v. 18, no. 2, 1966, 677-682

TOPIC TAGS: mixed crystal, indium compound, indium antimonide, indium telluride, effective electron mass, band structure, electron density, temperature dependence, antimonide, telluride

ABSTRACT: The paper deals with changes in the band structure due to transition from doped InSb to its solid solutions with InTe and analyze the variation of the electron effective mass in $(InSl)_x \cdot (InTe)_{1-x}$ with composition (x), concentration of electrons, and temperature. Based on the measurements of the thermoelectric power, transverse Nernst-Ettinghausen effect, conductivity, and Hall effect, the concentration and temperature dependence of the electron effective

Card 1/2

ACC NR: AP7001973

mass m* were calculated for crystals of the solid solution $(InSb)_x(InTe)_{1-x}$ (for x = 1 to 0.85) in the temperature range 100 to 370K. Solid solutions having $x > 0.99$ (I) behave like InSb doped with tellurium, and crystals of this type having electron concentrations (n) greater than $2 \times 10^{18} cm^{-3}$ show an m* (n) dependence which differs from that predicted by Kane. Solid solutions with $x \leq 0.99$(II) show a different temperature dependence of m* from those with $x > 0.99$. The authors thank O. V. Emelyanenko for his useful discussions. Orig. art. has: 5 figures, 4 formulas and 2 tables. [Based on authors' abstract] [DW]

SUB CODE: 20/SUBM DATE: 08Sep66/ORIG REF: 007/OTH REF: 011/

Card 2/2

SIDOROV, Vitaliy Il'ich; MYSHALOV, S.V., inzh., retsenzent; MARCHENKOV, I.A., tekhred.

[Die-casting machines] Mashiny dlia lit'ia pod davleniem. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1961. 156 p. (MIRA 14:6)
(Die-casting--Equipment and supplies)

GANTS, N.I.; ZAV'YALOV, I.A.; KRIVOROT'KO, V.M.; SIDOROV, V.I.; OSTRYAKOV, K.I., inzh., retsenzent; SHCHERBAKOV, V.P., inzh., red.; KHITROVA, N.A., tekhn. red.

[Preparing passenger cars for high-speed traffic; experience of the Oktiabr' Railroad] Podgotovka passazhirskikh vagonov dlia skorostnogo dvizheniia; opyt Oktiabr'skoi dorogi. Moskva, Transzheldorizdat, 1963. 47 p. (MIRA 16:10)
(Railroads--Passenger cars)

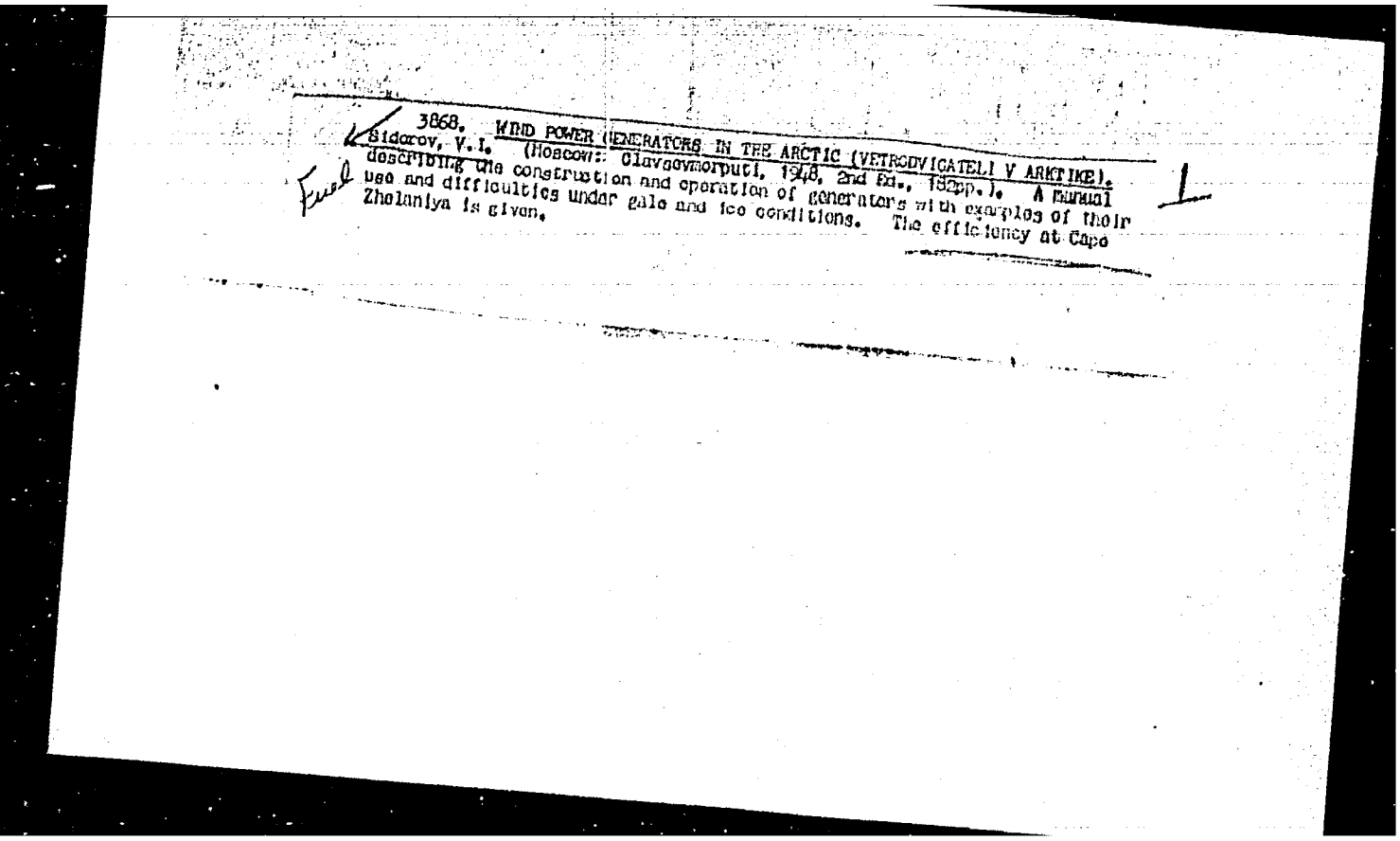
SIDOROV, V. I. (and others)

Bystrokhodnyi samoreguliruiushchiisia vetrodvigatel' D-18-GUSMP. (Moskva) Mashgiz, (1950) 179 p. illus. (Raboty, udostoennye Stalinskoi premii)

The D-18-GUSMP high-speed self-regulating wind turbine.

DLC: TJ825.S53

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.



3868. WIND POWER GENERATORS IN THE ARCTIC (VETRODVIGATELI V ARKTIKE).
Sidorov, V.I. (Moscow: Glavsevmorputi, 1948, 2nd Ed., 182pp.). A manual describing the construction and operation of generators with examples of their use and difficulties under gale and ice conditions. The efficiency at Cape Zhelaniya is given.

Fuel

L

REZVIN, A.Ye., inzh.; SIDOROV, V.I., inzh.

Stationary sprinkling systems. Vod.i san. tekh. no.10:22-26 O '62. (MIRA 15:12)

(Sprinkler irrigation)

SIDOROV, Viktor Ivanovich, inzhener; DOLKART, Gershin Shliomovich, inzhener; KARAMYSHEV, I.A., inzhener, redaktor; KHITROV, P.A., tekhnicheskiy redaktor

[Railroad structures of precast reinforced concrete and large wall blocks] Zheleznodorozhnye zdaniia iz sbornogo zhelezobetona i krupnykh stenovykh blokov. Moskva, Gos. transp. zhel-dor. izd-vo, 1956. 134 p. (MLRA 10:2)
(Precast concrete construction)
(Railroads--Buildings and structures)

KUZ'MINOV, Vladimir Aleksandrovich, inzh.; SIDOROV, Viktor Ivanovich; IVANOV-SKOBLIKOV, P.V., inzh., red.; KUBREVA, M.M., tekhn.red.

[Using brick blocks in building houses in Leningrad] Opyt stroitel'stva domov iz kirpichnykh blokov v g.Leningrade. Leningrad, Leningr.dom nauchno-tekhn.propagandy, 1958. 22 p. (Informatsionno-tekhnicheskii listok, no.39-40. Stroitel'naia promyshlennost') (MIRA 12:12)
(Leningrad--Brick houses)

SIDOROV, V.I., inzh.; KUZ'MINOV, V.A., inzh.

Vibration casings used for excavating pits under reinforced concrete electric line poles. Transp.stroi. 9 no.2:13-15 F '59. (MIRA 12:5)

(Excavating machinery) (Electric lines--Poles)

SIDOROV, V.I., inzh.

Electrification of the Leningrad-Malaya Vishera section.
Transp.stroi. 10 no.7:14-16 Jl '60. (MIRA 13:7)
(Railroads--Electrification)

KIRZHAKOV, G.M., inzh.; SIDOROV, V.I., inzh.

Results of the electrification of the Oktyabr'skaya road. Transp. stroi. 13 no.10:11-13 O '63. (MIRA 17:8)

L 06668-67 EWT(1)/EWT(m)/T/EWP(t)/ETI IJP(c) JD

ACC NR: AP6024459 SOURCE CODE: UR/0181/66/008/007/2022/2024

AUTHOR: Sidorov, V. I.; Sushko, T. Ye.; Shul'man, A. Ya.

ORG: Institute of Radio Engineering and Electronics, AN SSSR, Moscow (Institut radiotekhniki i elektroniki AN SSSR)

TITLE: Investigation of optic absorption in germanium doped with zinc and compensated with antimony

SOURCE: Fizika tverdogo tela, v. 8, no. 7, 1966, 2022-2024

TOPIC TAGS: optic absorption, germanium semiconductor, impurity center, excited state, ionization

ABSTRACT: This a continuation of earlier work (FTT v. 6, 3294, 1964 and preceding) where it was shown that the electrophysical photoelectric characteristics of germanium doped with zinc and compensated with antimony (Ge:Zn:Sb) depends strongly on the concentration of the Zn^- centers. The present investigation was aimed at determining the influence of the impurity concentration on the optical properties of Ge:Zn:Sb. The Zn^- concentration was varied from 1.4×10^{14} to 3×10^{16} cm^{-3}. The investigation of the absorption was in an optical helium cryostat. The impurity optocal absorption was measured by first passing monochromatic light through the investigated sample onto an infrared receiver, and then applying the light to the receiver without the sample. The results showed an appreciable growth of the coefficient of impurity absorption at $h\nu > .75$ Mev, with two maxima on the curves, corresponding to the transition of the

Card 1/2

holes from the ground sate of the impurity center to the excited state. The positions of the two maxima were independent of the concentration and were 75.4 ± 0.7 and 78.7 ± 0.3 Mev. An increase in the concentration of the Zn^- centers to 3×10^{16} cm^{-3} does not lead to a change in the energy distance between the levels of the Zn^- center, causing only a smearing of the excited state. The energy of optical ionization of the Zn^- center was found to be 82.7 Mev. It is shown that the time constant for recombination inter-impurity transitions of the hole from a Zn^0 center to a $Zn^=$ center is at least 10^4 times larger than the time for capture of a free hole by the $Zn^=$ center. The authors thank T. M. Lifshits and Sh. M. Kogan for interest in the work and a discussion. Orig. art. has: 1 figure, 3 formulas, and 1 table.

SUB CODE: 20/ SUBM DATE: 18Nov65/ ORIG REF: 003/ OTH REF: 007

kh

L 06411-67 EWP(e)/EWT(m)/EWP(t)/ETI IJP(c) JD
ACC NR: AP6026721 SOURCE CODE: UR/0181/66/008/008/2498/2500

AUTHOR: Sidorov, V. I. 48 B

ORG: Institute of Radio Engineering and Electronics, Moscow (Institut radiotekhniki i elektroniki)

TITLE: Photoconductivity in germanium doped with impurities of group III due to optical excitation of impurity centers

SOURCE: Fizika tverdogo tela, v. 8, no. 8, 1966, 2498-2500

TOPIC TAGS: photoconductivity, boron, indium, impurity center, germanium property

ABSTRACT: The photoconductivity of germanium doped with boron and indium in the spectral range corresponding to the optical excitation of these impurities was studied. The photoconductivity spectra at photon energies $h\nu < \epsilon_i$ (ϵ_i is the enrgy of optical ionization of the impurity) show a fairly distinct structure, and to each line in the photoconductivity spectrum there corresponds a line in the spectrum of optical absorption for samples with low impurity concentrations ($N_a < 3 \times 10^{14}$ cm^{-3}). The intensity of all the lines and the relative intensities of the individual lines depend on the temperature of the sample and the magnitude of the applied electric field. The correspondence between the photoconductivity lines and the lines of optical absorption of the impurity center indicates that the mechanism of such photoconductivity includes as the first step the transition of charge carriers to the excited level of the impurity

Card 1/2

L 06441-67

ACC NR: AP6026721

center. The transition of carriers to the valence band may occur either as a result of the influence of the applied electric field, or as a result of interaction with phonons. Orig. art. has: 2 figures and 1 table.

SUB CODE: 20/ SUBM DATE: 23Feb66/ ORIG REF: 002/ OTH REF: 005

Card 2/2 pla

YESAULOV, N.P.; NIKULIN, N.S.; SIDOROV, V.I.; STEPANYAN, N.N.; TSUGULIYEV, A.I.

Observations of the thermal radiation of the moon. Izv. Krym. astrofiz. obser. 30:273-283 '63. (MIRA 17:1)

S/594/61/000/000/007/011
D234/D303

AUTHORS: Subbotin, V.I., Kaznovskiy, S.P. and Sidorov, V.I. (Moscow)

TITLE: Investigating heat absorption by a liquid metallic heat carrier on models of plane heating elements

SOURCE: Soveshchaniye po teplo- i massoobmenu. Minsk, 1961. Tezisy dokladov i soobshcheniy (Dopolneniye), 39

TEXT: The paper gives a short review of the literature on problems of heat absorption by liquid metals in plane slot-shaped canals. Problems of heat modelling of the active zone of a nuclear reactor with plane heating elements are touched upon. The authors give a description of an experimental work on heat absorption by mercury in a canal of a rectangular cross section; data obtained on the distribution of temperatures on the walls of the canal are given. [Abstracter's note: Complete translation]

Card 1/1

25669

26.2221
21.5240

S/096/61/000/009/006/008
E194/E155

AUTHORS: Subbotin, V.I., Doctor of Technical Sciences, Kaznovskiy, S.P., Engineer, and Sidorov, V.I., Engineer.

TITLE: An investigation of heat uptake by liquid metal in a rectangular duct

PERIODICAL: Teploenergetika, 1961, No.9, pp. 68-72

TEXT: Plate-type heat exchangers offer promise for nuclear reactors with liquid-metal cooling. Numerous works have been published on the theoretical and experimental study of heat transfer to liquid metals in rectangular ducts, and previous work is briefly reviewed. Special mention is made of the difference between Nusselt numbers when the heat is taken away from one or from both sides of the duct. Retardation of the heat transfer medium occurs near the corners of the duct, so that the fluid should be more strongly heated in these places. Oxides of the liquid metal circulating in suspension may also have an appreciable influence on the temperature distribution in the wall and in the fluid. The authors have made an experimental study of heat transfer to light metals containing varying amounts of oxides in suspension in rectangular ducts. The results indicate

Card 1/ 6

that the oxides in suspension accumulate preferentially in the layer near the wall. It is also possible for the oxides to accumulate in the corners of the duct. An approximate analysis of heat transfer in a rectangular duct gives the following expression for the temperature distribution on the internal surfaces of the walls:

$$\frac{t_w - t_0}{qd_э}\lambda_1 = f\left(Pe, \frac{x}{d_э}, \frac{y}{d_э}, \frac{\delta_1}{d_э}, \frac{\delta_2}{d_э}, \frac{z_0}{d_э}, \frac{\lambda_2}{\lambda_1}\right) \qquad (5)$$

where: $t_w(x, y)$ is the temperature of the heat-transmitting wall of the duct; t_0 is the temperature of the heat transfer medium at inlet to the duct; q is the specific thermal flux through the wall averaged over the surface; $d_э$ is the equivalent diameter; λ_1, λ_2 are coefficients of thermal conductivity of the liquid and wall respectively; x is the coordinate of the length of the duct; y is the coordinate of the width of the duct; z is the coordinate of the height of the duct; δ_1 is the thickness of the heat-transmitting wall; δ_2 is the thickness of the end wall; $2z_0$ is the height of the section.

Card 2/6

25669
S/096/61/000/009/006/008
E194/E155

An investigation of heat uptake by ....

A great deal of experimental data and calculations would be required to determine the functional relationships. However, the authors have made a series of experiments on heat transfer in rectangular ducts and some of the results are given in this article. The heat transfer medium used was mercury of 99.9% purity, and it was filtered whilst in circulation. The experimental section was a duct of section 50 x 11.8 mm, 1000 mm long, made of steel 1Х18Н9Т (1Kh18N9T). Electric heaters were provided. Thermal losses on the experimental section were not measured or compensated but it is estimated that they were less than 1% of the applied thermal energy. In tests made with heating from two sides, the specific thermal fluxes through each of the heat-transmitting walls were the same to within 2 - 3%. The heat input was compared with the increased heat content of the mercury in the duct; the average difference was ± 2%. It was not possible to detect temperature variations over the length of the duct. Fig.3 shows experimental data on variations in the wall temperature distribution across the width of the duct with heat applied from both sides for the various values of Pekle's number indicated:

Card 3/6

(1 - Pe ≈ 420; 2 - Pe ≈ 590; 3 - Pe ≈ 850; 4 - Pe ≈ 1290; 5 - Pe = 1500 - 4100). It will be seen that near the centre of the duct there is a level part in the curve, which then falls to a minimum and later rise near the outer edges. This behaviour is evidently due to special features of the hydrodynamics of a rectangular duct. Fig.7 shows the relationship between the Nusselt and Pekle's numbers with heat supply from one and two sides: 'a' refers to the authors' experimental data with heating from two sides; 'b' the same but with single side; 1 refers to Martinelli's equation (Ref.1: R.C. Martinelli; Trans.ASME, 69, 8, Nov. 1947); 2 to Buleyev's equation for heat supply from both sides; 3 the same with heat supply from one side; 4 the equation of W.B. Harrison and J.R. Menke (Ref.2: Trans. ASME, 71, 7, Oct. 1949). Although the experimental results are in satisfactory agreement with curves calculated by the formulae of Martinelli, Buleyev and Harrison and Menke, it is still too early to draw firm general conclusions in this respect. Measurements similar to those described here have been made elsewhere in a round tube and the results indicate the presence of a contact thermal resistance when mercury is used. Hence it is not

altogether clear why in the present case the experimental data for the mean heat-transfer coefficient in a rectangular duct are in good agreement with theoretical calculations. The coincidence may apply only to this specific case. The demonstration of relatively high irregularity of temperature across the width of the heat-transmitting wall is of considerable importance in reactor design. It is necessary to make further investigations of special features of local heat transfer and hydrodynamics in rectangular ducts, so as to develop methods of calculating the temperature distribution in such cases.

There are 7 figures and 8 references: 5 Soviet and 3 English.
The English language references read as follows:

Ref.1: as quoted above.
Ref.2: as quoted above.
Ref.5: B. Lubarsky, S.I. Kaufman, National Advisory Committee for Aeronautics Report 1270, 1956.

Card 5/6

L 24827-65 EWT(m)/EPF(c)/EWT(j) Pc-4/Pr-4 RPL/SSD(c)/AFMD(t) RM

ACCESSION NR: AP4047325 S/0020/64/158/004/0868/0871

AUTHOR: Andrianov, K. A.; Sidorov, V. I.; Khananashvili, L. M.

TITLE: The reactivity of alkenylmethylsiloxanes in reactions with diazomethane and phenylazide

SOURCE: AN SSSR. Doklady, v. 158, no. 4, 1964, 868-871

TOPIC TAGS: alkenylmethylsiloxane, reactivity, nucleophilic addition reaction, diazomethane, phenylazide, Diels Alder condensation, vinyl cyclic organosiloxane, allyl cyclicsiloxane, IR spectrum, NMR spectrum

ABSTRACT: The addition reactions of diazomethane or phenylazide to vinyl- and allyl derivati ves of linear and cyclic organosiloxanes and the Diels-Alder diene condensation were investigated. Vinylheptamethylcyclotetrasiloxane (I) and 3-vinylheptamethyltrisiloxane (II) reacted readily with diazomethane at -15 to +20C with or without ultraviolet irradiation, to form Δ^1-pyrazolinyl derivatives which lost nitrogen on heating to 180-200C to form the corresponding allyl derivatives of the organosiloxanes. I and II likewise readily added phenylazide to form the

Card 1/2

L 24827-65
ACCESSION NR: AP4047325

2

N-phenylaziridinyl derivatives, probably via the triazoline intermediate. Compounds with the alkenyl group in the beta-position with respect to the silicon atom, e.g., allylheptamethylcyclotetrasiloxane did not react with diazomethane or phenylazide, further confirming that in nucleophilic addition reactions the vinyl group alpha to the Si atom is more reactive than in the beta position. II reacted with butadiene-1,3 to form 3-(cyclohexenyl-3-) heptamethyltrisoloxane. Molecular weights and molar refractions were determined and IR spectra were obtained for all the compounds; the NMR spectrum of 3-(Δ'-pyrazolinyl)-heptamethyltrisoloxane was obtained. "The authors sincerely thank M. T. Zaytsev for obtaining the IR absorption spectra." Orig. art. has: 4 equations and 9 formulae.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M. V. Lomonosova (Moscow Institute of Fine Chemical Technology)

SUBMITTED: 19May64 ENCL: 00

SUB CODE: GC, OC NO REF SOV: 001 OTHER: 001

Card 2/2

L 10802-65 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4 RM

ACCESSION NR: AP4045097 S/0020/64/158/001/0133/0136

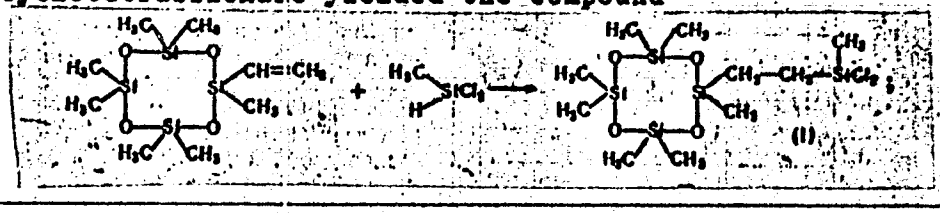
AUTHOR: Andrianov, K. A. (Corresponding member AN SSSR); Sidorov, V. I.; Khananashvili, L. M.; Bagratishvili, G. D.; Kantariya, M. L.; Tsitsishvili, G. V. (Academician AN GruzSSR)

TITLE: Addition of certain hydrogen-containing organosilicon compounds to vinyl derivatives of organocyclosiloxanes and to isoprene

SOURCE: AN SSSR. Doklady*, v. 158, no. 1, 1964, 133-136

TOPIC TAGS: addition reaction, chlorosilane, isoprene, organocyclosiloxane, chloroplatinic acid

ABSTRACT: The following reactions have been conducted in the presence of chloroplatinic acid: 1) Addition of methyldichlorosilane to heptamethylvinylcyclotetrasiloxane yielded the compound



(I)

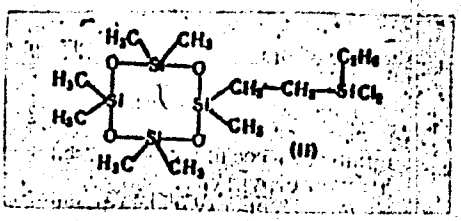
Card 1/4

L 10802-65

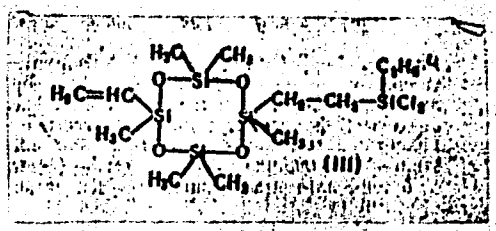
ACCESSION NR: AP4045097

O

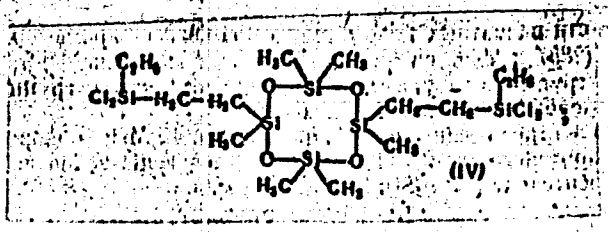
2) addition of ethyldichlorosilane to heptamethylvinylcyclotetrasiloxane or hexamethyldivinylcyclotetrasiloxane yielded the compounds (II,



(II)



(III)

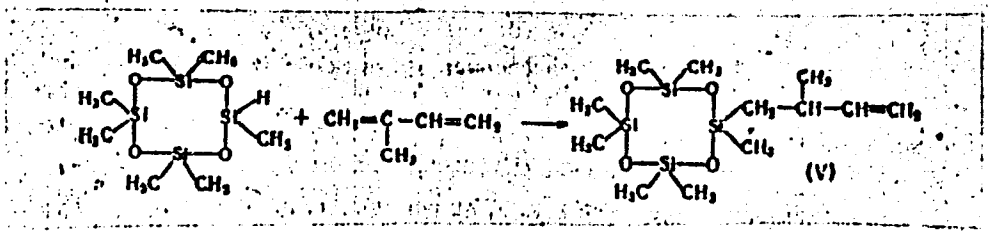


(IV)

Card 2/ 4

L 10802-65
ACCESSION NR: AP4045097

3) addition of isoprene to heptamethylcyclotetrasiloxane yielded the compound



The synthesized compounds were identified by chemical analysis, molecular weight determination, molar refraction, and IR spectroscopy; the NPR spectrum was recorded for compound II. Compounds I, II, III, IV, and V were obtained in yields of 65.5, 67.7, 63.2, 39.6, and 51.9%, respectively. They are liquids with molecular weights varying from 365 to 543 and with boiling points varying from 86 to 186C per 5 mm Hg. Orig. art. has: 1 table, 1 figure, and 5 formulas.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im.

Card 3/4

L 10802-65
ACCESSION NR: AP4045097

M. V. Lomonosova (Moscow Institute of Fine Chemical Technology)

SUBMITTED: 08Apr64 ATD PRESS: 3117 ENCL: 00

SUB CODE: OC, GC NO REF SOV: 001 OTHER: 001

Card 4/4

ANDRIANOV, K.A., akademik; SIDOROV, V.I.; KHANANASHVILI, L.M.

Reactivity of alkenylmethylsiloxanes in reactions with diazomethane and phenyl azide. Dokl. AN SSSR 158 no.4:868-871 O '64.
(MIRA 17:11)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M.V. Lomonosova.

L 40974-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM

ACCESSION NR: AP5006418 S/0062/65/000/001/0167/0169

AUTHOR: Andrianov, K. A.; Sidorov, V. I.; Khananashvili, L. M.; Kuznetsova, N. V.

TITLE: Reaction of the addition of methyldichloro- and dimethyl-chlorosilanes to vinyl-derivatives of organocyclosiloxanes

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 1, 1965, 167-169

TOPIC TAGS: silane, organosilicon compound, methyldichlorosilane, dimethylchlorosilane

ABSTRACT: The reactions of the addition of methylchloro- and dimethylchlorosilanes to vinylheptamethyl- and divinylhexamethylcyclotetrasiloxanes in the presence of an H_2PtCl_6 catalyst occur relatively easily and with good yields of the desired products. The $Si(CH_2)Cl_2$ and $Si(CH_3)_2Cl$ groups are joined to the β-carbon atom of the vinyl group of cyclosiloxane. Five new compounds were synthesized. "The authors express their deep gratitude to M. G. Zaytseva for taking the infrared absorption spectra." Orig. art. has: 2 tables, 1 equation.

Card 1/2

L 40974-65
ACCESSION NR: AP5006418

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy teckhnologii imeni M. V. Lomonosova (Moscow Institute of Fine Chemical Technology)

SUBMITTED: 22May64 INCL: 00 SUB CODE: GC, OC

NO REF SOV: 000 OTHER: 000

Card 2/2

L 29105-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM

ACCESSION NR: AP5003962 S/0079/65/035/001/0103/0106

AUTHORS: Andrianov, K. A.; Sidorov, V. I.; Khananashvili, L. M.; Nikitina, N. N.

TITLE: Synthesis of organic cyclosiloxanes containing unsaturated groups at the silicon atom

SOURCE: Zhurnal obshchey khimii, v. 35, no. 1, 1965, 103-106

23
22 B

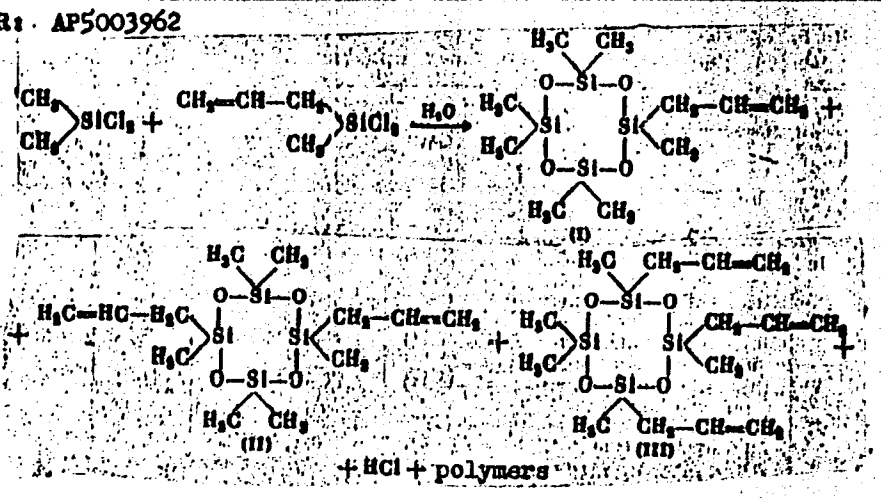
TOPIC TAGS: silicon, siloxane, cyclotetrasiloxane, hydrogen, vinyl, mechanical property

ABSTRACT: Compounds containing various numbers of allyl groups at the silicon atom in eight-member and six-member siloxane rings and cyclotetrasiloxane containing hydrogen and vinyl groups at various silicon atoms were synthesized. Simultaneous co-hydrolysis of methallyl dichlorsiloxane and dimethyl dichlorsilane in etheric solution yields six-member and eight-member cyclosiloxanes as shown by

Card 1/3

L 29105-65

ACCESSION NR: AP5003962



The IR spectra and the mechanical properties of the synthesized products are shown in Table 1 on the Enclosure. Orig. art. has: 1 table and 1 formula.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im M. V. Lomonosova (Moscow Institute of Fine Chemical Technology)

SUBMITTED: 28Oct63 ENCL: 01 SUB CODE: OC

NO REF SOV: 002 OTHER: 014

Card 2/3

L 29105-65

ACCESSION NR: AP5003962 ENCLOSURE: 01

Table 1

Nr. of compound	Name of synthetized compound	Boil.pt (p mm)	n_D^{20}	d_4^{20}	MR_D found	MR_D calc.
I	Heptamethyl allyl cyclotetrasiloxane	41° (3)	1.4119	0.9616	83.31	83.61
II	Hexamethyl diallyl cyclotetrasiloxane	57-58 (3)	1.4243	0.9684	91.78	92.10
III	Pentamethyl triallyl cyclotetrasiloxane	82 (3)	1.4347	0.9718	100.38	100.85
IV	Methyltetraethyl allyl cyclotrisiloxane	70-72 (1)	1.4340	0.9615	82.19	82.93
V	Dimethyldiethyl diallyl cyclotrisiloxane	67-69 (1)	1.4375	0.9629	82.12	82.88
VI	Tetramethyl trivinyl cyclotetrasiloxane	49 (5)	1.4247	0.9919	81.94	82.67

Card 3/3

ANDRIANOV, K.A.; SIDOROV, V.I.; KHANANASHVILI, L.M.; [illegible] VA, N.V.

Reaction of addition of methyldichloro- and dimethylchlorosilanes to vinyl derivatives of organocyclosiloxanes. Izv. AN SSSR Ser. khim. no.1:167-169 '65. (MIRA 18:2)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M.V. Lomonosova.

ANDRIANOV, K.A.; SHIONOV, V.I.; MEDZMARASHVILI, L.M.; KUZNETSOVA, N.V.

Reactions of cohydrolysis of methylvinyldichlorosilane with various alkylchloronlanes. Zhur. ob. khim. 35 no.3:524-527 Mr '65. (MIRA 18:4)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni M.V. Lomonosova.

L 41575-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM

ACCESSION NR: AP5008841 S/0079/65/035/003/0524/0527

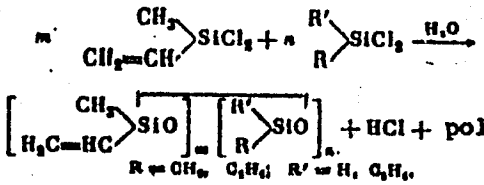
AUTHOR: Andrianov, K. A.; Sidorov, V. I.; Khananashvili, L. M.; Kuznetsova, N. V.

TITLE: Cohydrolysis of methylvinyldichlorosilane with various alkylchlorosilanes

SOURCE: Zhurnal obshchey khimii, v. 35, no. 3, 1965, 524-527

TOPIC TAGS: silane, silicon organic compounds, hydrolysis, organic synthesis

ABSTRACT: The cohydrolysis reaction of methylvinyldichlorosilane with different alkylchlorosilanes was studied according to the following scheme:



1-methyl-1-vinyl-3,3,5,5-tetraethylcyclotrisiloxane and 1,1-diethyl-3,5-dimethyl-

Card 1/2

L 41575-65
ACCESSION NR: AP5008841

3,5-divinylcyclotrisiloxane were produced by cohydrolysis of methylvinyldichlorosilane with diethyldichlorosilane. Cohydrolysis of methylvinyldichlorosilane with methyldichlorosilane produced 1,3,5,7-tetramethyl-1-vinylcyclotetrasiloxane and 1,3,5,7-tetramethyl-1,5-divinylcyclotetrasiloxane. 1-Methyl-1-vinyl-3,5,7-triethylcyclotetrasiloxane, 1,5-dimethyl-1,5-divinyl-3,7-diethylcyclotetrasiloxane and 1-ethyl-3,5,7-trimethyl-3,5,7-trivinylsiloxane were produced by cohydrolysis of methylvinyldichlorosilane with ethyldichlorosilane. Orig. art. has: 1 table.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M. V. Lomonosova (Moscow Institute of Fine Chemical Technology)

SUBMITTED: 02Jan64 ENCL: 00 SUB CODE: OC

NO REF SOV: 001 OTHER: 000

Card 2/2

L 57009-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM

ACCESSION NR: AP5010792

UR/0079/65/035/004/0698/0700
546.287 : 542.938

AUTHORS: Andrianov, K. A.; Sidorov, V. I.; Khananashvili, L. M.; Kuznetsova, N. V.

TITLE: Cohydrolysis reaction of methylallyldichlorosilane with methyl- and ethyldichlorosilanes

SOURCE: Zhurnal obshchey khimii, v. 35, no. 4, 1965, 698-700

TOPIC TAGS: silane, esterification

ABSTRACT: Cohydrolysis of methylallyldichlorosilane (A) with methyldichlorosilane (B), mole ration 0.5:1, leads to the formation of 1-allyl-1,3,5,7-tetramethylcyclotetrasiloxane (I). Yield is 10.5% and 1,5-diallyl-1,3,5,7-tetramethylcyclosiloxane (II) yield is 23.9%. For mole ratio A:B = 1:0.5 [illegible] triallyl-1,3,5,7-tetramethylcyclotetra- Cohydrolysis of [illegible]

...art. has: 5 formulas and 1 table.

Card 2/2

SIDOROV, V.I.; LIFSHITS, T.M.

Photoelectric properties of zinc and gold doped germanium.
Radiotekh. i elektron. 7 no.12:2076-2085 D '62. (MIRA 15:11)
(Transistors) (Photoconductivity)

SIDOROV, V.I.

Electroconductivity ans Hall effect at low temperatures in germanium alloyed with zinc. Fiz. tver. tela 5 no.10:3006-3010 O '63. (MIRA 16:11)

1. Institut radiotekhniki i elektroniki AN SSSR, Moskva.

KOGAN, Sh. M.; LIFSHITS, T. M.; SIDOROV, V. I.

"Photoconductivity in germanium due to the optical transitions between the impurity centers."

report submitted for Intl Conf on Physics of Semiconductors, Paris, 19-24 Jul 64.

Inst Radio Engineering & Electronics, AS USSR

L 11426-65 EWT(1)/EWG(k)/EWT(m)/EEC(t)/EWP(t)/EWP(b) Pz-6 IJP(c)/SSD/
AFWL/AS(mp)-2/ESD(gs)/ESD(t) AT/JD
ACCESSION NR: AP4048403 S/0181/64/006/011/3294/3300

AUTHORS: Kogan, Sh. M.; Lifshits, T. M.; Sidorov, V. I.

TITLE: Photoconductivity due to optical transitions between impurity centers

SOURCE: Fizika tverdogo tela, v. 6, no. 11, 1964, 3294-3300

TOPIC TAGS: photoconductivity, optical transition, impurity center, impurity concentration, germanium, semiconductor doping

ABSTRACT: This paper reports an experimental verification of an effect theoretically deduced by the authors previously (ZhETF v. 46, 395, 1964), wherein optical transitions take place directly between neighboring impurity centers in semiconductors having high impurity concentrations. The object of the investigation was germanium doped with zinc and antimony, grown from a melt by the Czochralski method. The samples measured 6 x 2 x 2 mm and were provided with indium elec-

Card 1/2

L 14426-65
ACCESSION NR: AP4048403

2

trodes. The samples were placed in a helium cryostat with cesium iodide windows. The measurements were made in a variable light flux modulated at approximately 400 cps. The monochromatic radiation energy was measured with a calibrated vacuum thermocouple. Various mechanisms explaining the observed long-wave peak of photoconductivity are analyzed briefly and it is concluded that the observed experimental results can be best reconciled with optical transitions between the impurity centers. It is also indicated that similar effects should be observed also in other materials. "The authors thank S. G. Kalashnikov for a valuable discussion." Orig. art. has: 4 figures and 5 formulas.

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR, Moscow (Institute of Radio and Electronics, AN SSSR)

SUBMITTED: 26May64 ENCL: 00

SUB CODE: SS NR REF SOV: 003 OTHER: 003

Card 2/2

KOGAN, Sh.M.; LIFSHITS, T.M.; SIDOROV, V.I.

Photoconductivity due to optical transitions between impurity centers. Fiz. tver. tela 6 no.11:3294-3300 N '64. (MIRA 18:1)

1. Institut radiotekhniki i elektroniki AN SSSR, Moskva.

ACCESSION NR: AP4012570 S/0056/64/046/001/0395/0396

AUTHORS: Kogan, Sh. M.; Lifshits, T. M.; Sidorov, V. I.

TITLE: Optical transitions between near impurity centers and the associated photoconductivity

SOURCE: Zhurnal eksper. i teoret. fiz., v. 46, no. 1, 1964, 395-396

TOPIC TAGS: optical transition, tunnel effect, photoconductivity, carrier tunnel transition, semiconductor, highly doped semiconductor, germanium, zinc impurity, antimony compensation impurity

ABSTRACT: Optical tunnel transitions of carriers between nearby impurity centers of different type occurring in a semiconductor at sufficiently high impurity concentration, and the resultant characteristic photoconductivity, are investigated. This effect can also be observed when the necessary two levels are due to a single impurity with several charge states. Germanium doped with zinc and

Card 1/2

ACCESSION NR: AP4012570

compensated with antimony was used at liquid-helium temperature. The observed peak is attributed to an optical transition of a hole from a Zn^- ion to a nearby similar ion. A second hole of the resultant Zn^0 neutral atom wanders along the Zn^- ions and contributes to the jump in conduction. Arguments are advanced in favor of this interpretation. "The authors are grateful to S. G. Kalashnikov for valuable discussions." Orig. art. has: 1 figure.

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR (Institute of Radio Engineering and Electronics, AN SSSR)

SUBMITTED: 06Nov63 DATE ACQ: 26Feb64 ENCL: 01

SUB CODE: PH NO REF SOV: 002 OTHER: 001

Card 2/3

L 6480-66 EWT(l)/EWT(m)/T/EWP(t)/EWP(b)/EWA(h) IJP(c) JD/AT

ACC NR: AP5028015 SOURCE CODE: UR/0386/65/002/008/0365/0368

AUTHOR: Kogan, Sh. M.; Lifshits, T. M.; Sidorov, V. I.

ORG: Institute of Radio Engineering and Electronics, Academy of Sciences, SSSR (Institut radiotekhniki i elektroniki Akademii nauk SSSR)

TITLE: Recombination radiation stimulated in silicon by long wavelength infrared radiation

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu (Prilozheniye), v. 2, no. 8, 1965, 365-368

TOPIC TAGS: recombination radiation, silicon, IR photoconductor, photosensitivity, spectral distribution

ABSTRACT: The purpose of the investigation was to check the conditions under which charge exchange increases the photoresponse of a semiconductor in the region of impurity absorption of light and causes the appearance of recombination radiation stimulated by light from the impurity-absorption region. The existence of such a mechanism was experimentally confirmed, using silicon doped with boron and antimony (N_B = 8×10^{13} cm^{-3}, $N_{Sb} = 2 \times 10^{14}$ cm^{-3}). A silicon sample measuring 2 x 2 x 6 mm was mounted in a standard helium cryostat, in which the sample could be cooled to 7--9K. The sample was illuminated through a cold window (filter) of indium antimonide with modulated monochromatic radiation in the wavelength range from 8 to 20 μ. The sample could be simultaneously exposed to unmodulated light from a small incandescent lamp placed in a cryostat. Besides the sample, a commercial germanium photodiode with a

Card 1/3

0901 1750

L 6480-66

ACC NR: AP5028015

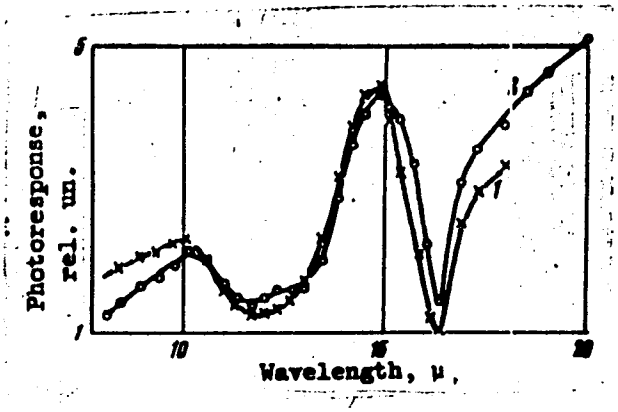


Fig. 1. Spectral distribution of the photocurrent in a silicon sample (2) and in a germanium photodiode (1), relative to the monochromatic power incident in the InSb cold filter

glass entrance window was mounted in the cryostat so that it could register the possible radiation from the sample. The photoresponses of the sample and of the photodiode were registered with a standard measuring circuit, including an amplifier, a synchronous detector, and an automatic recorder. The photodiode did not respond to the modulated IR radiation unless the additional lamp was also on, or, conversely, to the additional lamp alone without the IR radiation. On the other hand, when the sample was simultaneously illuminated by the lamp and by the modulated IR radiation from

Card 2/3

L 6480-66

ACC NR: AP5028015

the monochromator, a photoresponse signal at the frequency of the IR-radiation modulation was produced by the germanium photodiode (Fig. 1). The figure shows the spectral distribution of the photoresponse of the germanium photodiode (Curve 1) as well as the spectral curve of the photocurrent from the silicon sample (Curve 2). The photodiode signal and the photoresponse of the sample depend on the intensity of the unmodulated illumination. The photocurrent induced in the sample by the illumination could increase by a factor of more than 100, but without a change in the spectral distribution of the photoconductivity. The agreement between the spectral distribution of the silicon sample and the germanium photodiode, together with the fact that the photoresponse of the diode is produced only by simultaneous exposure of the silicon sample to the monochromatic radiation and the additional illumination, shows decisively that recombination radiation stimulated by long wavelength IR light occurs in charge-exchanged silicon. It is thus proved that the long wavelength radiation was transformed in this experiment into short wavelength radiation with an appreciable gain (by a factor -20) in the photon energy. Authors thank K. I. Svistunova for supplying the test material. Orig. art. has: 1 figure. [02]

SUB CODE: OP/ SUBM DATE: 07Aug65/ ORIG REF: 002/ ATD PRESS: 4140

Card 3/3

L 57125-65 EPF(c)/EPA(s)-2/EWT(m)/EWP(b)/EWP(t) Pr-4/Pt-7 IJP(c) JD/JG

ACCESSION NR: AP5014598 UR/0181/65/007/006/1877/1878

AUTHOR: Sidorov, V. I.; Shul'man, A. Ya.; Sushko, T. Ye. 43 42 B

TITLE: The influence of the electric field on the longwave edge of impurity photoconductivity of germanium alloyed with zinc and mercury

SOURCE: Fizika tverdogo tela, v. 7, no. 6, 1965, 1877-1878

TOPIC TAGS: impurity photoconductivity, germanium impurity photoconductivity, impurity center, photoconductivity

ABSTRACT: The impurity photoconductivity of Ge:Zn:Sb p-type (level 0.09 ev, $N_{Zn} \sim 10^{15}$ cm^{-3}) and Ge:Hg (level 0.087 ev, $N_{Hg} \sim 10^{14}$ cm^{-3}) specimens was measured at the temperatures of liquid helium and solid nitrogen for different electric field intensities. The position and shape of the longwave edge of impurity photoconductivity were found to depend on the applied electric field. An increased electric field caused a shift in the longwave boundary to the side of smaller energies and changed the shape of the curve. The shift of the boundary was linked with the lowering of the potential barrier of the impurity center resulting from the application of the electric field. Experimental data show that in a range of fields from 2 to 100 v/cm the boundary shift, taken along the 0.5 level, can be expressed as

Card 1/2

L 57125-65

ACCESSION NR: AP5014598

$$\Delta\varepsilon_{0.5} = -A2\sqrt{\frac{Ze^3}{\chi}E},$$

where the constant $A \sim 3$, Z is the charge number of the impurity center, χ is the dielectric constant, E is the intensity of applied field, and e is the electron charge. In addition to the shift of the longwave boundary in the Ge:Zn:Sb specimen at helium temperature, a photosensitivity peak appeared at energies of 0.075—0.078 ev. It is assumed that this peak is associated with the excited states of Zn^-. Orig. art. has: 2 figures. [JA]

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR, Moscow (Institute of Radiotechnology and Electronics, AN SSSR)

SUBMITTED: 13Jan64 ENCL: 00 SUB CODE: EM, SS

NO REF SOV: 001 OTHER: 002 ATD PRESS: 4036

Card 2/2

ACC NR: AP6036959 (A, N) SOURCE CODE: UR/0181/66/008/011/3208/3212

AUTHOR: Lifshits, T. M.; Sidorov, V. I.; Nad', F. Ya.

ORG: Institute of Radio Engineering and Electronics, AN SSSR, Moscow (Institut radiotekhniki i elektroniki AN SSSR)

TITLE: Extrinsic photoconductivity of germanium doped with antimony, arsenic, boron, or indium

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3208-3212

TOPIC TAGS: photoconductivity, impurity conductivity

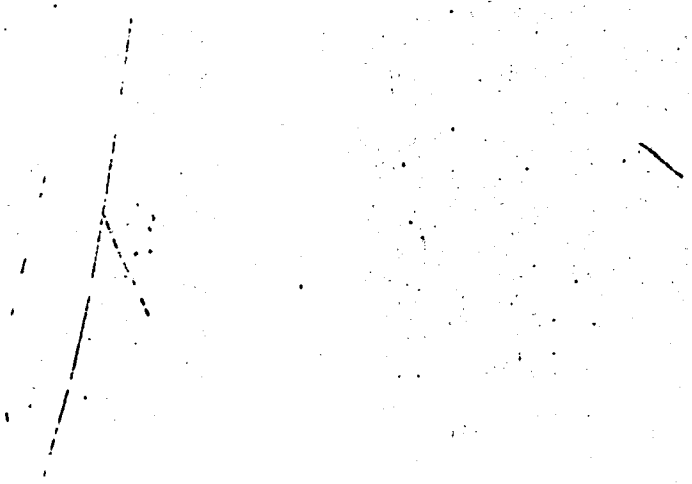
ABSTRACT: The spectral distribution of the extrinsic photoconductivity of germanium containing various amounts of Sb, As, B and In ($6 \times 10^{13} - 6 \times 10^{17}$ cm^{-3}) was studied. Data on the impurity concentrations, charge carrier mobilities and ionization energies of the impurities in the samples studied are given. They show that as the concentration of the donor impurity N_d increases, the thermal ionization energy ϵ_t decreases considerably and it is equal to zero when $N_d = 6 \times 10^{17}$ cm^{-3}. Data are presented on the shape of the spectral photoconductivity curve as a function of the concentration of the n- and p-impurities in germanium and of the magnitude of the electric field in the samples. In conclusion, authors thank N. P. Likhtman, who measured the electrophysical parameters of the series of samples of doped germanium. Orig.

Card 1/2

ACC NR: AP6036959

art. has: 6 figures and 1 table.

SUB CODE: 20/ SUBM DATE: 21Mar66/ ORIG REF: 004/ OTH REF: 005



Card 2/2

SIDOROV, V.K.

Merchant shapes. Standartizatsiia 25 no.10:38-39 O '61. (MIRA 14:9)

(Steel, Structural—Standards)

SIDOROV, V.K.

Meeting of the Committee ISO/TK 65 "Manganese ores." (MIRA 15:2)
Standartizatsiia 26 no.2:60-61 F '62.
(Manganese ores--Standards)

SIDOROV, V.M., inzh. po bureniyu

URB-2A need improving. Neftianik 6 no.1:19 Ja '61.
(MIRA 14:4)

1. Trest Kuybyshevneftegeofizika.
(Kuybyshev Province—Oil well drilling rigs)
(Seismic prospecting—Equipment and supplies)

SIDOROV, V.M. [Sydorov, V.M.]

Genetic indications of the difference between primary and secondary plagioclase twins. Trudy Inst. geol. nauk AN URSR. Ser. petr., min. i geokhim. no.20:84-93 '63.
(MIRA 16:8)

SIDOROV, V. M.

"Production of charged π-mesons by nucleons."
Zh. eksper. teor. Fiz., 28, No. 6, 727-9, 1955

Cross sections for production of π^+- and π^- mesons by protons of 657 MeV on carbon and for $\pi^\pm$-production by protons on hydrogen (contained in paraffin) are obtained. Carbon and liquid hydrogen targets are bombarded with neutrons produced by 670 MeV protons incident on beryllium. Energy distributions of the mesons are given. Mesons were detected in all cases by emulsions.

Sidorov, V. M.

USSR/ Physics - Pie-mesons

Card 1/1 : Pub. 22 - 17/60

Authors : Meshcheryakov, M. G., Memb. Corresp. of the Acad. of Scs., USSR; Neganov, B. S.; Bogachev, N. P.; and Sidorov, V. M.

Title : The $p+p \longrightarrow d+\pi^+$ reaction at 460 Mev

Periodical : Dok. AN SSSR 100/4, 673-676, Feb 1, 1955

Abstract : Experiments with the $p+p \longrightarrow d+\pi^+$ reactions are described. The experiments were intended to establish a relationship between the nuclear cross-sections and the proton energy. The experiments showed that the cross-section of the above reaction increased by 8 times when the proton energy was increased from 340 up to 460 Mev. and kinetic energy of π -mesons increased from 22 Mev. up to 72 Mev. The experiments also show the angular distribution of π -mesons due to $p+p \longrightarrow d+\pi^+$ reaction. Ten references: 3 USSR and 7 USA (1951-1954). Diagram; graphs.

Institution : Acad. of Scs., USSR, Institute of Nuclear Problems

Submitted : .....

SIDOROV, V.I.

The production of charged mesons by 660 MeV protons on H, D and C (II/62)

CERN-Symposium on High Energy Accelerators and Pion Physics

Geneva 11-23 June 56
In. Branch 75

SUBJECT USSR / PHYSICS
AUTHOR SIDOROV, V.M.
TITLE The Production of Positive Pions by (p-p)-Collisions at an Energy of 660 MeV.
PERIODICAL Zurn.eksp.i teor.fis, 31, fasc.2, 178-187 (1956)
Issued: 20.11.1956

Here the energy spectra and the energy distribution of positive pions occurring on the occasion of the reactions $p + p \rightarrow d + \pi^+$ and $p + p \rightarrow p + n + \pi^+$ are studied with the help of the synchrocyclotron of the Institute for Nuclear Problems of the Academy of Science in the USSR.

Experimental Method: In the orbit of the proton bundle emitted from the accelerator a vessel containing liquid hydrogen was mounted. By means of a further collimation system the pions emitted at 60, 75, 90, 105 and 120^o in the direction of the proton bundle were selected and registered by means of nuclear photoemulsions. For the construction of the π^+-spectra about 2000 $(\pi \rightarrow \mu)$-acts of decay were used in the case of each of these angles.

Experimental Results: In the case of all angles (except 60^o) the energy distributions found have marked maxima in the hard part of the spectrum. The position of the maxima corresponds to the meson energies computed from the kinematic conditions of the reaction $p + p \rightarrow d + \pi^+$. The continuous spectrum within the domain of lower energies corresponds to the mesons produced on the occasion of the reaction $p + p \rightarrow p + n + \pi^+$. The cross section $(d\sigma/d\omega)$ of the reaction $p + p \rightarrow d + \pi^+$ amounts to approximately 10% of the total cross section for the

SIDOROV, V. M.

C-3

USSR/Nuclear Physics

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 11095

Author : Sidorov, V.M.

Inst : Institute of Nuclear Problems, Academy of Sciences, USSR

Title : Formation of Positive Pions in (p-p) Collisions at 600 Mev.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 51, No 2, 178-187

Abstract : With the aid of nuclear photoemulsions, measurements were made of the energy spectra of positive pions from the reaction $p + p \rightarrow \pi^+ + d$ at an energy of 657 ± 8 Mev pn for angles θ equal to -60, 75, 90, 105 and 120°, in the laboratory system. The angular dependences of the cross sections $d\sigma/dw$ (σ*) were found in the center of mass system of the colliding nucleons, as were the total cross sections for the

Card 1/2

USSR/Nuclear Physics

C-3

Abs Jour : Ref Zhur - Fizika, No 5, 1957, 11095

reactions pp $\rightarrow \pi^+ + \begin{Bmatrix} d \\ pn \end{Bmatrix}$, pp $\rightarrow d\pi^+$, and pp -- pn π^+.

The results are in agreement with the assumption that the mesons are formed principally in the p-state. With this, along with the transitions into the S state of the final n-p system, a substantial contribution is given by the transitions in which the final nucleons are formed in the P-state.

Card 2/2

SIDOROV, V.M.

"The Production of Charged π Mesons by 660 MeV Protons on Hydrogen," Deuterium and Carbon," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

SIDOROV, V. M.

4599

PRODUCTION OF POSITIVE PIONS IN (p–p) COLLISIONS AT 660 Mev. V. M. Sidorov (Academy of Sciences, USSR) Soviet Phys. JETP 4, 22-30(1957) Feb.

Using nuclear emulsions, the energy spectra of positive pions produced in the reaction $p + p \rightarrow \pi^+ + \{d/p + n\}$ at an energy of 657 ± 8 Mev have been measured at angles, θ_π equal to 60°, 75°, 90°, 105° and 120° in the laboratory system. The angular dependence of the cross section $d\sigma/d\omega(\theta^*)$ in the center-of-mass system of the colliding nucleons and the total cross section for the reactions: $p + p \rightarrow \pi^+ + \{d/p + n\}$ and $p + p \rightarrow p + n + \pi^+$ has been determined. The results are consistent with the assumption that the mesons are produced chiefly in p-states. In addition to transitions to the S-state of the final (n–p) system, it is found that an important contribution is made by transitions in which the final state is a P-state. (auth)

120-6-29/36

AUTHORS: Sidorov, V.M., and Trukhin, M.I.

TITLE: A Stamp for Marking of Emulsions (Shtamp dlya markirovki emul'sionnykh kamer)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No.6, pp. 109 - 110 (USSR)

ABSTRACT: The authors have used the photographic method of producing a reference co-ordinate grid directly on the surface of emulsions. It is well known that if a photographic emulsion is illuminated by light of short wavelength, then only the upper layers (a few microns) are blackened. The same effect may be obtained with nuclear emulsions by illuminating them with ordinary light for a very short time. In this way, one can produce a picture of a reference grid on top of a nuclear emulsion (in this case 400 μ thick). In the case of a stack of emulsions, this grid can be produced on top of each successive emulsion in a strictly defined position. In this way, the grid can be used for following through tracks from one emulsion to another. A photograph of the apparatus is shown in Fig.1 and a microphotograph of the grid in Fig.2. The apparatus consists essentially of an arrangement for locating the emulsions relative to the grid and suitable short period illumination. The image of the grid does not greatly interfere with the images of tracks in the emulsion when the latter are inspected through a microscope. There are 2 diagrams.

Card1/2

A Stamp for Marking of Emulsions. 120-6-29/36

ASSOCIATION: United Institute for Nuclear Studies (Ob"yedinennyy Institut yadernykh issledovaniy)

SUBMITTED: May 6, 1957

AVAILABLE: Library of Congress.

Card 2/2

AUTHOR: Sidorov, V.M., Grigor'yev, Ye.L. 56-5-18/46

TITLE: Observation of Particles With Charges $Z > 2$ in Evaporation Processes Produced When Highly Energetic Neutrons Impinge Upon Photographic Emulsion Nuclei (Nablyudeniye chastits s zaryadom $Z > 2$ v rasshcheplenlyakh, obrazovannykh v fotoemul'sii ney-tronami vysokoy energii)

PERIODICAL: Zhurnal Eksperim. i Teoret.Fiziki, 1957, Vol. 33, Nr 5, pp. 1179-1184 (USSR)

ABSTRACT: Photoplates with a highly sensitive emulsion of 200 μ thickness were exposed in a collimated neutron current. The neutrons were produced by the impinging of 480 MeV protons on a beryllium target. The neutron energy spectrum has its maximum at ~395 MeV. After working on about 10 037 of the registered stars the following may be said:

a) The average number of "rays" in the stars amounts to 3.8.
b) Within the rays in the stars 19 hammer-like traces, 16 pairs of α -particles with a very small angular aperture, 2 cases of flying apart of 3 α -particles in a narrow cone, 4 traces of Be^8, 1 case of B^9 emission, and 23 traces of particles with $Z > 2$ were observed.

Card 1/2

56-5-18/46

Observation of Particles With Charges $Z > 2$ in Evaporation Processes Produced When Highly Energetic Neutrons Impinge Upon Photographic Emulsion Nuclei

c) The cross section for the emission of particles with $Z > 2$ was determined at $(2,8 \pm 1,4)$ mb.
d) The cross section for the emission of Li^8 and Be^8 was determined at (0.8 ± 0.4) mb and (1.3 ± 0.6) mb respectively.

There are 4 figures, 1 table, and 16 references, one of which is Slavic.

ASSOCIATION: United Nuclear Research Institute (Ob"yedinennyy institut yadernykh issledovaniy)

SUBMITTED: June 8, 1957

Card 2/2

AUTHORS: Bogachev, N. P., Van Shi-Fen', Gramenitskiy, I. M., Kirillova, L. F., Lebedev, R. M., Lyubimov, V. B., Markov, P. K., Merekov, Yu. P., Podgoretskiy, M. I., Siderov, V. M., Tolstov K. D., Shafranova, M. G.

TITLE: The Interaction of 9 Bev Protons with Nuclei in Photo-Emulsion (Vzaimodeystviye protonov s energiyey 9 Bev s yadrami foto-emul'sii)

PERIODICAL: Atomnaya Energiya, 1958, Vol. 4, Nr 3, pp 281 - 284 (USSR)

ABSTRACT : The photoemulsion НИКФИ-Р with a layer of about 450 μ was irradiated with protons within and out of the vacuum chamber of the 9 Bev synchrophasotron. The mean range of 9 Bev protons for an interaction is 34,7 ± 1,5 cm. (The scattering for angles below 5^0 was not taken into account). 258 cases of a nuclear interaction were observed. The mean number of fast particles n generated in a process of interaction amount to 3,4 ± 0,7. The angular distribution of these particles shows a clearly preferred forward motion. The mean number of black and grey traces N_h - the recoil nuclei not being considered [illegible] is 8,3 ± 0,5.
From 249 found stars 18 can be considered to constiute an interaction of the initial protons with "free" or quasifree" protons.
13 stars can be considered to represent an interaction between protons and quasifree" neutrons. All of them have an odd number of traces, and in the point of formation of the stare β-traces can be observed. The mean number of fast particles in these 13 star traces is 3,1 ± 0,3 . There are 5 figures, 1 table, and 7 references, 1 of which is Slavic.

Sidorov V. M.

55-2-48/51

AUTHORS: Bogachev, N. P. , Mikhul, A. K. , Petrashku, M. G. , Sidorov, V. M.

TITLE: On the Angular Distribution of the Positive Myons Generated by a (π-μ)-Decay (Ob uglovom raspredelenii μ^+-mezonov ot (π-μ)-raspada)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 2, pp. 531 - 532 (USSR)

ABSTRACT: First the authors mention several earlier works dealing with the same subject. The present work gives the results of the examination of 10.000 (π-μ)-decay processes of positive myons which came to a standstill in an НИКФИ emulsion of the P type. The emulsions were irradiated in a positive beam of the synchrocyclotron of the Laboratory for Nuclear Problems (Laboratoriya yadernykh problem) and during their exposure they were encased within a steel screen which protected them against the action of the exterior magnetic field. The (π-μ)-decay processes were observed by means of an examination with the МБИ-3 microscope with about 100-fold en-

Card 1/3

On the Angular Distribution of the Positive Myons Generated by a (π -μ)-Decay

largement. The angular distribution resulting immediately on inspection is shown in a diagram. The asymmetry coefficient of this angular distribution is b = - 0,048 $\pm$ 0,020. Then the authors shortly report on the estimate of systematical errors. The probability of the observation of a (π -μ)-decay process decreases within the range of small values of the angle θ^* between the final direction of the positive pion and the initial direction of the positive myon. The distribution determined by direct observation was corrected taking into account the registration probability and the experimentally determined distribution of the angles between the initial direction and the final direction of the positive pions. The corrected distribution of positive myons through the projections of the angles is shown in a diagram. The coefficient of asymmetry of this angular distribution is b = + 0,009 $\pm$ 0,018. Therefore the angular distribution of that part of positive myons which are generated by the π -μ-decay of the positive pions which had come to a standstill is isotropic. The cause for the asymmetry observed in some works can at least partly be connected with a systematical error investigated in this work. There are 2 figures,

56-2-48/51

On the Angular Distribution of the Positive Myons Generated by a (π-μ)-Decay

and 5 references, none of which is Slavic.

ASSOCIATION: United Institute for Nuclear Research
(Ob"yedinennyy institut yadernykh issledovaniy)

SUBMITTED: December 4, 1957

AVAILABLE: Library of Congress

1. Myons-Scattering 2. Synchrocyclatron-Applications 3. Emulsion irradiation-Processes

Card 3/3

56-34-4-52/60

AUTHORS: Bunyatov, S. A., Vrublevskiy, A., Kopylova, D. K., Korolevich, Yu. D., Petukhova, N. I., Sidorov, V. M., Shukhipchak, B., Filipkovskiy, A.

TITLE: The Emission of V^0-Particles During the Capture of K-Mesons by Nuclei in a Photoemulsion (Ispuskaniye V^0-chastits pri zakhvate K-mezonov yadrami v fotoemul'sii)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 4, pp. 1028 - 1030 (USSR)

ABSTRACT: A stack of Ilford G-5 emulsion, each having a thickness of 600 μ, was irradiated with K^--mesons with momenta of about 300 MeV/c in the bevatron at Berkeley. An examination of the stack disclosed about 3 cases of a decay of Λ^0-particles in the immediate vicinity of σ_k-stars (Refs 1, 2, 3). In this connection the authors endeavored to find a correlation between the process of production and the decay of the Λ^0-particle when they are not within the same range of vision of the microscope. The process of microscopical inspection is described. The σ_k-stars, the two-membered stars

Card 1/3

and all traces longer than 500 μ of single protons, which began within the emulsion layer were recorded. In this way 18 cases of the decay of Λ^0-particles were found. The authors give a short report on their search for the production processes. The production processes were found for 13 Λ^0-particles. The results of the measurements are compiled in a table. In 5 cases no producing σ_k-stars were observed. The corresponding Λ^0-particle could have formed in such a nuclear spallation caused beyond the checked range by a K^--meson which had not come to a stop. Also other possible explanations for the failure to find the producing σ_k-star are mentioned. The comparison of the decays of Λ^0-particles with the producing processes can be useful for the investigations of different nuclear reactions accompanying the production of Λ^0-particles as well as for the investigation of the Λ^0-particles themselves.
The authors thank Ye. Gerulo, Professor M. Danysh and M. I. Podgoretskiy for raising the problem and for valuable advice with respect to this work. There are 1 table and 4 references, 0 of which are Soviet.

Card 2/3

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (United Institute of Nuclear Research)

SUBMITTED: January 16, 1958

1. Mesons—Nuclear reactions

Card 3/3

SOV/2o-121-4-12/54

21(7)

AUTHORS: Bogachev, N. P., Bunyatov, S. A., Merekov, Yu. P., Sidorov, V. M.

TITLE: The Interaction of Protons With an Energy of 9 BeV With Free and Bound Nucleons in a Photoemulsion (Vzaimodeystviye protonov s energiyey 9 BeV so svobodnymi i svyazannymi nuklonami v fotoemul'sii)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 4, pp 617-62o (USSR)

ABSTRACT: An emulsion chamber with 1oo layers of the type NIKFI-R (2) (with a thickness of ~ 450 μ and with an area of 10.10 cm^2) was irradiated by 9 BeV protons of a synchrophasotron. The emulsion layers were investigated along the tracks of the primary protons. On a length of 485 m 1308 interactions of protons with nuclei were found. The processes of scattering into an angle of less than 5^o are not included in this number. 178 of these 1308 interactions are interactions of protons with nucleons in the photoemulsion. The authors found 115 cases which are similar to (p - p)-interactions and 63 cases similar to (p - n)-interactions. The cross section of the

Card 1/4

inelastic (p - p)-interaction at 9 BeV amounts to 30 millibarn. Within the interval 1 - 9 BeV, the cross section of the inelastic (p - p)-interaction is practically constant, and apparently it is constant also in the region of higher energies. 11 of the 115 (p - p)-interactions are due to the elastic (p - p)-scattering on hydrogen in the emulsion. The differential cross sections of the elastic (p - p)-scattering cannot be estimated because the experimental data are insufficient. The total cross section of the elastic (p - p)-scattering at 9 BeV (with respect to the necessary corrections and of the background due to the quasielastic (p - p)-scattering ($\sim$10 %)) amounts to

$\sigma_{pp}^{elastic} = (10 \pm 4)$ millibarn. This total cross section is constant (within the limits of experimental errors) in the interval 6 - 9 BeV. An estimation of the total cross section of the (p - p)-interaction at an energy of 9 BeV (the sum of the elastic and of the inelastic cross sections) gives the value $\sim$ 40 millibarn. A diagram gives the angular distributions

The Interaction of Protons With an Energy of 9 BeV With Free and Bound Nucleons in a Photoemulsion

of the charged particles due to the (p - p)- and(p - n)-interactions are equal within the limits of experimental errors. Also the angular distributions of the fast charged particles due to the (p - p)- and (p - n)-interactions have the same values. The average free path for the nuclear interaction of the fast secondary particles due to the (p - p)-interactions and (p - n)-interactions is equal to (34 ± 6) cm and (28 ± 7) cm, respectively. These values are not different from the free paths for the interaction of protons and pions with energies of 1 - 6 BeV and they also agree with the results obtained by other authors. According to the results of this paper the average free length of path for the interaction of 9 BeV protons with the nuclei of a photoemulsion amounts to (37,1 ± 1,0) cm. In a following paper, the above-given results will be compared with the results of the calculations according to the statistical theory of the multiple production of particles. The authors thank Professor V. I. Veksler for his interest in this paper and also Professor V. P. Dzhelepov and R. M. Ryndin for the discussion of the results. There

SOV/...

The Interaction of Protons With an Energy of 9 BeV With Free and Bound Nucleons in a Photoemulsion

are 1 figure, 1 table, and 20 references, 9 of which are Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (United Institute of Nuclear Research)

PRESENTED: June 5, 1958, by L. A. Artsimovich, Academician

SUBMITTED: June 3, 1958

Card 4/4

21(8) SOV/20-128-3-16/58

AUTHORS: Batusov, Yu. A., Bogachev, N. P., Sidorov, V. M., Chulli, I.

TITLE: Formation of Mesons by π^+-Mesons With 260 Mev Energy on Nuclei in a Photoemulsion

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 3, pp 491-494 (USSR)

ABSTRACT: When a positive pion collides with a nucleon in a compound nucleus, two charged mesons may be formed by the following reactions: $\pi^+ + p \rightarrow \pi^+ + \pi^+ + \eta$ (I), $\pi^+ + n \rightarrow \pi^+ + \pi^- + p$ (II). The authors investigated reactions (I) and (II) on the interaction of fast positive pions with nuclei in the photoemulsion. An emulsion chamber composed of ten layers of the emulsion NIKFI of the kind R (thickness 400 μ, diameter 80 mm) was irradiated in a beam of positive pions with 307 Mev energy in the synchrocyclotron of the Laboratoriya yadernykh problem (Laboratory for Nuclear Problems) of the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research). Considering the slowing-down of mesons in the emulsion, the results of measurement were referred to an energy of (200±20)Mev

Card 1/4

Formation of Mesons by π^+-Mesons With 280 Mev Energy on Nuclei in a Photoemulsion

of primary mesons. 13 (+ 4 probable) cases with two secondary mesons were recorded in 300 stars which had been found in the emulsion layers. In about 40% of the cases recorded only the track of a secondary particle could be found. When positive 280-Mev pions collide with nuclei of the photoemulsion, these pions in the nucleus are absorbed as often as negative pions. Disintegrations totalled 92 with slowed-down negative pions, and 106 with positive ones. Further investigation disclosed that 39 of these 198 disintegrations contained two secondary charged mesons. A diagram illustrates the energy distribution of mesons for the cases in which two secondary mesons were emitted. 7 of 112 investigated mesons possessed an energy of more than 60 Mev. The spectrum attained its maximum within the range 30-40 Mev. The major part of secondary mesons have an energy of less than 60 Mev, and the mean energy of the latter amounts to 30 Mev. The second diagram shows the spectrum of stopped negative pions. It resembles that mentioned above, yet it is distinctly shifted toward lower energies. The mean energy of negative pions amounts to 16 Mev.

SOV/2o-128-3-16/58

Formation of Mesons by π^+-Mesons With 280 Mev Energy on Nuclei in a Photoemulsion

The difference in the mean energies of positive and negative pions ($\sim$ 14 Mev) is due to the effect of the Coulomb field of the nucleus. The angular distribution of pions within the center-of-mass system is not isotropic, and attains a wide maximum at angles of $\sim 180^{\circ}$. A table shows the angular distribution of mesons for cases with two mesons. A distinct correlation in the direction of emission of the two secondary mesons is noticed here. The cross sections of meson formation during the collision of positive pions with nuclei in the photoemulsion were determined by comparing the number of formation processes with the number of stars produced by mesons within the same emulsion volume. The medium range of positive pions for star formation in the emulsion amounts to (32.4 $\pm$ 2.3) cm. The cross sections of the formation of charged mesons in the processes π^- + nucleus $\rightarrow \pi^-$ and π^- + nucleus $\rightarrow \pi^+$ are of the same order of magnitude. In most cases, the resultant mesons are absorbed in the same nucleus. For the reactions $\pi^+ + n \rightarrow \pi^+ + \pi^- + p$ and $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, the cross sections (0.3 $\pm$ 0.2) and

Card 3/4

Formation of Mesons by π^+-Mesons With 280 Mev Energy on Nuclei in a Photoemulsion

0.1 mb were obtained. The authors thank Professor V. P. Dzhelepov for his interest in this investigation. There are 4 figures, 2 tables, and 10 references, 6 of which are Soviet.

PRESENTED: May 27, 1959, by L. A. Artsimovich, Academician

SUBMITTED: May 11, 1959